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Sonic refugia: nature, noise abatement and landscape design in West Berlin

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This paper extends the history of landscape design and urban green planning by discussing the work of landscape designers in West Berlin, who attempted to create 'sonic refugia' using trees, bushes and other plants for noise abatement purposes. It expands the narrow conceptions of landscape as a solely visual experience also to include the acoustic realm. Motivated by increasing concerns over the physiological and psychological effects of noise pollution, and drawing on late nineteenth and early twentieth century ideas of nature as a remedy for the negative effects of modern urban life, this paper places the work of landscape designers in the context of ongoing discourses on the intersections of urban nature and public health. Sonic experiments with plants of the 1960s not only draw our attention to the acoustic qualities of urban nature, but also open reflections on the wider historical, political and cultural contexts in which urban landscapes were experienced. Hereby, West Berlin's marginal spaces or *terrains vagues*, which emerged as accidental by-products of the island city's spatial confinement, were exemplary sites in their attempts to foreground the sensory experience of space.

> For just as there are plants that are said to confer the power to see into the future, so there are places that possess such a virtue. For the most part, they are deserted places—treetops that lean against walls, blind alleys or front gardens where no one ever stops.
>
> Walter Benjamin[1]

> […] the ear is not indifferent to the beauty of street trees.
>
> Rudolf Kühn[2]

Introduction

In his book *Die Straßenbäume* ['The street trees'], published in 1961, the botanist Rudolf Kühn illustrates the complex acoustic ecology of street trees. West Berlin's street trees, he writes, 'create sound waves through the rustling of leaves, the sounds of insects and birds in the tree tops, and the reflections of the sounds of traffic. […] But more importantly, trees 'swallow' a substantial range of noise created by cars, trams and aeroplanes, amplified through reflections on the pavement and the surfaces of

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houses.[3] Kühn advocates the use of nature to create 'metropolitan oases shielded from surging noise'.[4] He vividly describes the ways in which street trees —and the insects and birds inhabiting this urban ecological niche—can alter the aesthetic encounter with urban space, turning a potentially disorientating or harmful experience into one of sonic delight. His attentive reflections speak to the complex aesthetic and multi-sensory dimensions of urban nature largely neglected in functionalist approaches to noise abatement prevalent in the 1960s.

Attempts to modify urban soundscapes often focus on questions of public health and noise pollution.[5] Recent examples include large-scale landscape designs, such as the Buitenschot Park (2011–2013) near Amsterdam's Schiphol Airport, which includes 150 ridges to deflect the low drone of aeroplanes landing and departing on the fifth runway. Such 'thresholds of silence', to borrow a term from the artist De Kort, are part of a longer history of noise abatement design strategies dating back to the 1960s.[6] Zoning regulations and public health legislation have led to 'acoustic gentrification'—the fragmentation and privatisation of urban space, shielding only certain socio-economic groups.[7] At the same time, noise has also served as a demonstration tactic and strategy for the same groups it also oppresses, reifying a certain paradox of modernity as ethno-musicologist David Novak claims.[8] If we consider the politics of noise, is there a 'right to silence'?

As a term, 'noise pollution' partakes of the wider ecological critique of modernity that emerged in the 1960s, echoing Rachel Carson's *Silent Spring* (1962), which lamented the loss of birdsong as a sign and measure for environmental degradation. Ecological debates of the period describe noise as solely a technological or human-made by-product, assuming that a purer, natural or authentic sonic realm exists, which human activity contaminated or lost through processes of urbanisation. Those debates establish a divide between nature and city, environment and culture, also prevalent at the time in the newly emerging field of acoustic ecology.[9] If we consider the work of urban botanists, such as Kühn, it becomes clear that opposing noisy urban environments with the tranquillity of rural landscapes is much too simplistic. Landscape designers in West Berlin did not contrapose nature and the city, but saw potential in the use of nature to modify acoustically the quality of urban space.

The history of noise as a public health concern dates further back. In 1910, for example, the German microbiologist Robert Koch compared noise to bacterial diseases, stating 'one day, people will have to fight noise like cholera and pest'. In the German context, historians have traced noise abatement efforts back to around 1900 with the introduction of legal regulations, structural measures and civic campaigns.[10] However, unlike the modern paradigm of water supply and sanitation that led to radical infrastructural changes in the 'bacteriological city' in the second half of the nineteenth century, practical responses to noise pollution have not transformed the built environment on a similar scale.[11] Yet we can trace certain parallels in the idea that nature can serve as counter-measure to the negative effects of modernity.

Architectural and landscape discourses have generally discussed urban wastelands in visual terms. In

this paper, I examine how emerging concerns over noise pollution in landscape design are closely connected to the post-war history of green planning in West Berlin, specifically as pertaining to the often overlooked marginal sites of the island city. In fact, I argue that those marginal sites emerged as experimental fields for botanists and landscape designers, who advocated the use of plants to alter the acoustic environment and improve public health by attempting to create 'sonic refugia'—comparable to 'silent zones' in contemporary urban planning. I trace how they experimented with urban vegetation, leaves, bushes, trees in bomb sites, dilapidated infrastructural ruins and other accidental and non-designed spaces that—in the case of West Berlin—emerged through intersecting processes of geopolitical division and cycles of investment and disinvestment in urban space. I conclude by comparing the work of landscape designers in the 1960s, who were concerned with the negative health effects of noise pollution, with more recent landscape design projects which have turned formerly abandoned railway spaces in Berlin into public parks. Thus, this paper contributes to recent architectural literature that is building a more nuanced historiography of the ecological work of the 1960s and thereafter.[12]

Island laboratory

From the early 1960s onwards, the 'Walled-in' city of West Berlin emerged as a distinctive kind of laboratory that renewed the legacy of modernism.[13] The construction of the Berlin Wall in 1961 radically transformed the fabric of the city for a second time after wartime destruction and consolidated West Berlin as an urban enclave. The enclave's spatial isolation was not only an impediment, but also a catalyst for a range of experimental spaces and ideas to flourish. Scientists and landscape designers, amongst others, were forced to focus 'on their doorstep' and spaces within the confines of the Wall, since the hinterland beyond the watchtowers and the barbed wire was out of reach. Within this landscape, sound held a central space in shaping the cultural and material meanings of the island city, as Hans Scharoun's Philharmonic concert hall, opened in 1963, reveals.

In the 1960s, sonic experimentation in West Berlin went beyond the realm of architecture and the walls of the urban auditorium. Surrounded by a vast urban wasteland, the Philharmonic concert hall was built amidst weeds, bushes and trees taking over the ruins of the former diplomatic quarter. The area constituted the border zone along the newly constructed Wall, in between the disconnected railway lines of the Potsdamer and Anhalter railway stations. These anomalous spaces served as field sites for a range of unusual experiments. Apart from issues of architectural acoustics, green planners and landscape designers began to explore the 'acoustic ecology' of the surrounding urban landscape. Hans Scharoun and his acoustician Lothar Cremer had already recognised the insulating potential of these sites, arguing that they could shield the newly built auditorium from unwanted sounds.[14]

The history of sonic experimentation in landscape design is closely interlinked with the history of green planning in West Berlin. Although a comprehensive master plan for Berlin under the paradigmatic vision of the *Stadtlandschaft* [city landscape] with extensive spaces for nature was abandoned after the geo-

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political division of the city in 1948, the creation of urban green spaces remained a priority of early reconstruction efforts.[15] In the 1950s green planners, concerned with public health, advocated the use of plants to improve the quality of both air and sound in the island city. This included the use of vegetation to filter unhealthy dust produced in the ongoing clearing of rubble and the extension of urban greenery to improve 'bad air' and noise caused by increasing motorised traffic.[16] In 1958, the municipal green planner Rudolf Dittmann conducted an initial empirical study on the use of trees, hedges and green boulevards for noise abatement purposes. Using decibel sound meters, Dittmann measured sound levels in eight different public spaces, including parks, streets and a hospital garden in Berlin's southwestern district of Steglitz-Zehlendorf. His goal was to explore the potential of green spaces as 'hygienic and prophylactic measures in the battle against the damages of human civilisation'.[17] Such damage included hearing loss and the effects of noise on productivity and well-being more generally. The initial results prompted municipal green planners to further research and to advocate the use of plants in the battle against urban noise.

Concerns over public health became even more pressing in the early 1960s, when access to nature was limited due to the loss of the countryside; a condition that intensified in the poorer Berlin districts by then even further marginalised on the edge of the city bounded by the Wall.[18] The question of limited green space and intensifying noise in the urban enclave became more contentious with the Senate's introduction of a new land use plan under the planning paradigm of 'urbanity by densification'.[19] Official planning policies in West Berlin caused a new phase of demolition and rebuilding, increasing levels of noise across the city, especially alongside major transport routes (Fig. 1). Large-scale infrastructural projects, such as the construction of a city motorway system to cut across historical squares, public green spaces and urban wastelands, such as the former Görlitzer railway station, followed the West German planning discourse at the time (Fig. 2). Yet, West Berlin provided a distinctive context due to its spatial confinement and specific financial arrangements for sustaining the 'Walled-in' enclave. Such arrangements included public subsidies and tax incentives for private investors that propelled the speculative dynamics of urban development causing both the loss of urban nature and a severe housing crisis.[20]

The densification paradigm spurred opposition from municipal green planners later followed by local neighbourhood protests opposing large-scale transport planning projects resulting in the founding of *Bürgerinitiativen* [citizens' initiatives] from the mid-1970s onwards. Norbert Schindler, who worked as West Berlin's director of green planning, tried to strengthen the position of open-space planning. He criticised 'the vehement urge for architectural densification' and the unequal allocation of open spaces across the city.[21] He proposed Martin Wagner's concept of *intensive Freiflächenpolitik* [intensive open space politics], that originated in the context of Weimar Berlin, to address the problem of spatial confinement in the island city. Only extensive scientific studies of green spaces and practical solutions for improving their 'efficiency

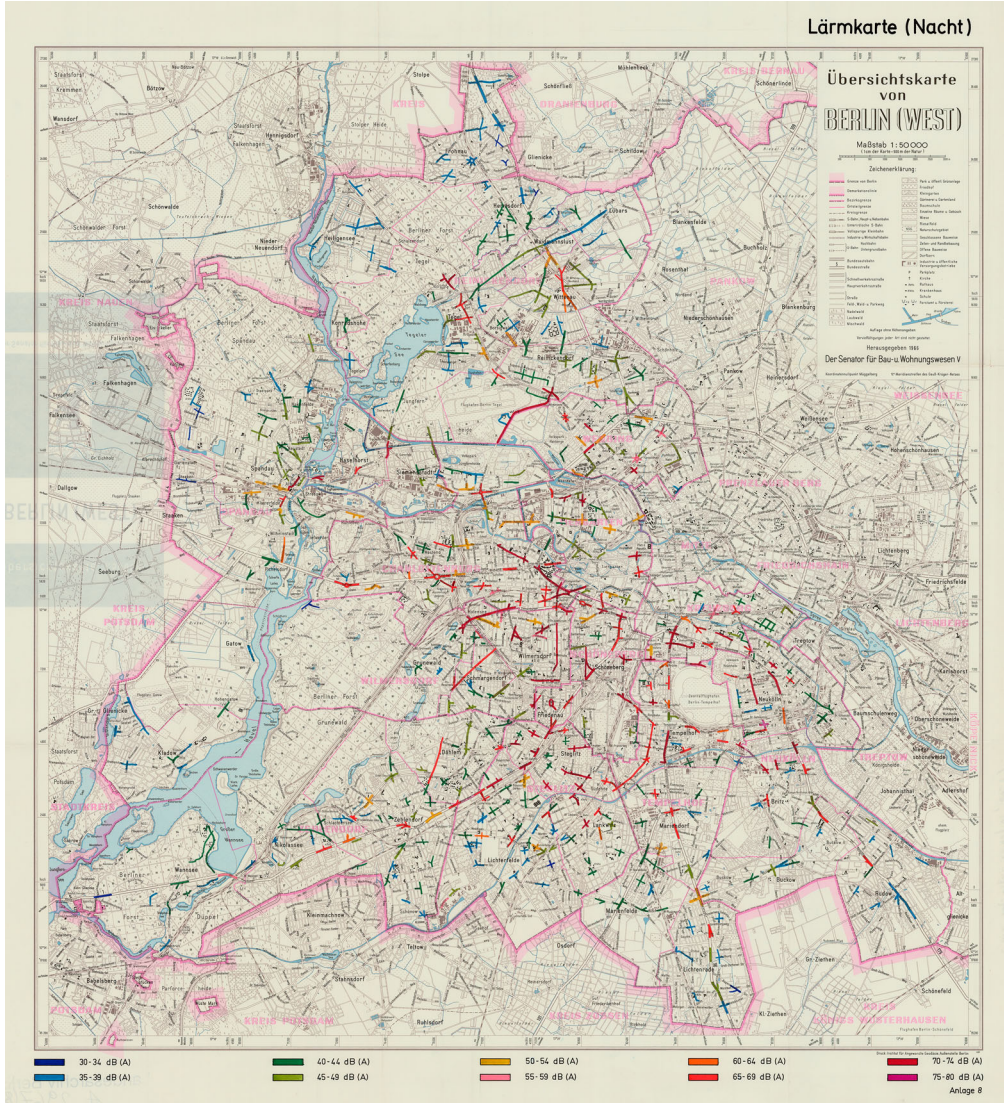

Figure 1. Noise map of West Berlin, 1966 (source: Landesarchiv Berlin).

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Figure 2. Public viewing of the new city motorway, Berlin Steglitz, 1966 (photograph by Bert Sass; source: Landesarchiv Berlin).

and economic viability' by enhancing their *Erholungskapazität* [recreational capacity] could induce positive change.[22]

Throughout the 1960s and 1970s landscaping needs competed with housing, industrial plans and transport for the city's attention and resources. But the Senate provided financial support for so-called 'green research' to explore how remaining spaces of urban nature in the island city could be used more effectively. Under the direction of the landscape architect Hermann Mattern at the Technical University Berlin, landscape designers conducted a range of empirical studies on the demand for and quality of open spaces in new and existing public housing developments, such as the Charlottenburg-Nord housing estate designed by Hans Scharoun, where landscape designers sought to improve the quality of light, air, colour, sound, as well as the social aspects of those open spaces.[23] They also studied the maintenance costs of public spaces and the impact of nature on human well-being. Drawing from earlier public health debates, nature served as a potential remedy to urban life, this time with a key concern for the acoustic quality of open spaces.

The protection of street trees was one particularly contentious issue in this wider debate over the provision of nature in West Berlin. Citing *Die gemordete Stadt* (1964) by the writer Wolf Jobst Siedler, a critique of the technocratic rationalisation of space in the context of urban renewal processes, Schindler called for the preservation and planting of street trees in an 'act of protest'.[24] Within this context, the botanist Rudolf Kühn pointed to the aesthetic qualities of street trees as multi-sensory spaces. In his comprehensive study of West Berlin's street trees, Kühn proposed that the beauty of street trees is not only visual, but also acoustic. Street trees create a 'singing street', but the 'soft, melodic whispers created by poplars' are often drowned out by 'the noise of humans and their traffic' those 'ugly sounds […] of the inner city'.[25] Regarding the olfactory realm, Kühn describes how the 'fragrant street' is difficult to classify as smell is closely linked to the subjective human experience of space. Specific odours can recall very personal experiences, ranging from 'erotic incitements' to 'repelling memories'.[26]

Over several years Kühn had studied hundreds of trees on his own street close to the Botanical Garden in Berlin's southwestern suburbs. He emphasises how ordinary street trees are generally neglected for their aesthetic qualities and the ways in which they can positively transform the sensory experience of public space. He praised the tranquillity of the suburbs and their quieter side streets, overlooking the unequal distribution of green spaces across the city, especially within the former working-class districts of Kreuzberg, Wedding and Tiergarten. Whilst the provision of public spaces of nature in West Berlin became a highly debated issue, local green planners and landscape designers focussed their concerns on parks and initially overlooked the extensive inner-city wastelands and their emerging role as surrogate forms of public space.

Terrains vagues

The division of Berlin created an array of anomalous spaces. Together with the rubble landscapes, bombed plots and abandoned railway lines, stretch-

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ing across the vast area of Berlin's former centre, the new border zone and other marginal spaces became 'field laboratories' for different forms of cultural and scientific experimentation. Since they officially belonged to the GDR, some of these sites were exempt from development pressures until the late 1980s, leading to their prolonged abandonment. From the late 1950s onwards, these seemingly abandoned spaces were used as experimental fields by botanists and landscape designers.

West Berlin's marginal spaces are difficult to classify due to their layered histories characterised by wartime destruction, political division and isolation, and post-war economic decline and neglect. We can find a range of words that refer to these non-designed elements of urban space. In a Berlin context we can trace expressions, such as *Trümmerlandschaft* [rubble landscape], a term used to describe spaces that emerged from wartime destruction, and the word *Brache*, which translates as fallow or untilled land and refers to a space, or a period when a site is not utilised for a specific purpose. However, these terms do not fully capture the complexity of marginal spaces, as they are linked to specific historical events, or centred on the utilitarian use of these sites. In English, a range of terms—marginal space, interstitial space, edge-lands—describes those spaces, and, most recently, the adoption of the French term *terrain vague*.[27]

Berlin has emerged as a key place, sparking a renewed critical interest in the cultural and scientific aspects of urban wastelands. Recent explorations of the history of urban ecology have re-examined the work of botanists such as Hildemar Scholz and Herbert Sukopp, who first studied assemblages of ruderal nature (plants growing in bombed plots, rubble heaps, railway areas and other marginal sites) in the destroyed post-war city as early as the mid-1950s.[28] They highlighted the importance of marginal spaces as 'ecological refugia' and sites of scientific inquiry. However, Berlin's *Brachen* have not only played a significant role for urban biodiversity and environmental awareness, they have also gained increasing attention in aesthetic discourses and new approaches in landscape design. Since the 1990s, we can follow a range of critical reflections on urban wastelands, voids and post-industrial landscapes in landscape history. In a German context, landscape designers have made key interventions to transform these 'anxious landscapes'—as the architectural historian Antoine Picon refers to the post-industrial ruins and wastelands which emerged from the mid-1970s onwards—into public parks.

The landscape architects Peter and Anneliese Latz, for example, have unearthed and incorporated found objects, debris, dilapidated structures and other material remnants of the industrial landscape into their design for the park Duisburg Nord in the Ruhr district to invoke a ruin aesthetic and reveal how these ostensible empty sites are in fact repositories of cultural history.[29] With regards to new forms of spontaneous nature flourishing in post-industrial landscapes, the landscape architect Udo Weilacher has called for a new aesthetic vocabulary to challenge prevalent notions of the picturesque that fail to account for the spontaneously growing post-industrial forests in the Ruhr area.[30]

The term *terrain vague* has gained prominence in architectural and landscape discourses since the

mid-1990s. The Spanish architect Ignasi de Solà-Morales Rubío introduced it in the context of urban photography.[31] De Solà-Morales Rubío suggests the use of *terrain vague* to capture spaces located outside urban cycles of production and investment. He states:

> Unincorporated margins, interior islands void of activity, oversights, these areas are simply un-inhabited, un-safe, un-productive. In short, they are foreign to the urban system, mentally exterior in the physical interior of the city, its negative image.[32]

This narrowly utilitarian use of the term *terrain vague* overlooks the ecological and cultural dimensions of marginal spaces, their multi-faceted uses, and their sensory and aesthetic value. A merely economic conceptualisation of *terrain vague* as 'the city's negative image' portrays marginal spaces as counter-images of the city. Yet, it neglects their key role as part of the city's alternative public sphere, as ecological habitats, key sites of scientific inquiry and spaces of urban memory.

The term *terrain vague* carries a distinct connection to the history of Berlin. The French philosopher and writer Jean-Michel Palmier used the term *terrain vague* in his book *Berliner Requiem* (1976), a personal account of wandering through the city of West Berlin in search for traces of the city's Weimar past. In his reflections on the changing urban landscape, he contrasted observations of marginal spaces with past images recalling the lost history of these spaces, including the former Anhalter railway station, and the border zone at Potsdamer Platz. The latter he describes as 'a vast desert-like surreal and sinister landscape of terrains vagues, with heaps of stones, rusty and twisted metal'.[33] By contrasting past and present, Palmier's contemplative writing reveals a strange disjuncture between the violent *Entleerung* [emptying] of space by wartime destruction, forced displacement, bombing, dispossession and expropriation, and the everyday use of these now marginal sites.

The traumatic landscapes of wartime destruction became spaces of ecological curiosity and of a range of everyday activities, including the collection of edible herbs, dog walking, children playing, and as sites for circuses, squatters and sexual encounters.[34] Thus, these *terrains vagues* defy easy categorisations and inspire multi-layered meanings and interpretations. They can simultaneously be read as voids or material remnants through which traumatic memories are traced, as spaces of scientific discovery flourishing with life, and as surrogate forms of public space. This complex multi-layered history of marginal spaces in West Berlin is an important precursor to these discourses on ruins and post-industrial landscapes that emerged from the 1990s onwards. Whilst their aesthetic dimension has been largely discussed in visual terms, their relevance exceeds a solely visual experience and involves multi-sensory dimensions, including the acoustic, tactile and olfactory realms.

Sonic refugia

In the 1960s, botanists increasingly focussed on the city itself as a 'scientific laboratory' due to travel restrictions, which made journeys beyond the confinements of the Walled-in enclave difficult. These 'phantom limbs'[35] of former railway lines, border zones and extraterritorial sites within the boundaries of the enclave provided *botanisches Neuland* [new

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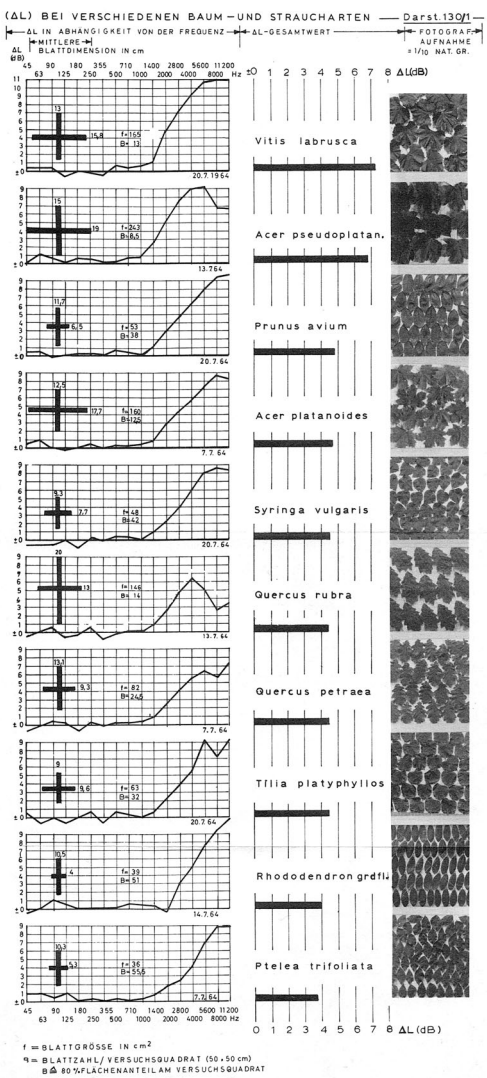

Figure 3. Sound level reduction of different types of trees and bushes (source: Gerhard Beck, *Untersuchungen über Planungsgrundlagen für eine Lärmbekämpfung im Freiraum*, 1965, Appendix).

botanical territory] for urban ecologists, who listed new or endangered species in previously undiscovered spaces, such as the former Potsdamer railway station and the bombed plots around Potsdamer Straße and Leipziger Platz.[36] In parallel to the studies of botanists and drawing on their scientific insights, landscape designers began to explore the 'acoustic ecology' of these spaces.

Using plants to alter noise levels in public spaces was a possibility investigated by the Berlin gardener and landscape designer Gerhard Beck. In the early 1960s, for his doctoral dissertation and a subsequent longer-term research project, Beck explored the *artspezifische Lärmminderungsvermögen* [species-specific noise reduction capability] of trees and bushes.[37] Beck used these marginal sites and other open spaces, including parks and heath landscapes on the edge of the city, for his sonic experiments with plants. His experimental and technically enhanced surveys were aimed at developing practical solutions for improving the sonic quality of open spaces by reducing noise, primarily caused by motorised traffic. Beck extended existing tools for addressing the problem of noise in the city, such as legal regulations, zoning plans for the rationalisation of space, and architectural structures, such as noise protection walls, by studying urban nature as a 'biological tool' for urban design.[38] His research was financed by the Berlin Senate as part of a larger research project under the direction of Hermann Mattern investigating how landscape design can improve the quality and efficiency of publicly accessible spaces of nature in the city.

Previous research on the auditory aspects of nature—a marginal field within acoustic engineering

and landscape design—had rarely undertaken fieldwork in open spaces. Acoustic engineers had largely focussed on examining the structural qualities of plants, testing the size, form, position and density of leaves in laboratories, such as at the Acoustic Laboratory of Düsseldorf's Medical Academy. In 1959, the acoustic engineers Franz Josef Meister and Walter Ruhrberg conducted sonic tests on the edge of forests outside the city of Düsseldorf. They translated what they observed as the sound buffering qualities of *Waldriegel*—forests functioning as 'sonic walls'—to an urban context, suggesting that staggered *Baumriegel* [tree walls] be planted 'to create sound-protected sanctuaries in cities'.[39] Beck criticised such generalised landscape designs for neglecting the complexity of each distinctive place, the meteorological aspects influencing the auditory dimension of space and the seasonal changes of urban greenery.[40]

West Berlin's assemblages of spontaneous vegetation growing in the inner-city waste spaces in Tiergarten, the Hasenheide Park in Neukölln and the Dahlemer Feld in Grunewald, a large open heath landscape with sand dunes, provided Beck with the possibility of studying a wide variety of different plants and urban environments. With loudspeakers and a frequency generator, Beck projected high- and low-pitched sounds onto trees, assemblages of plants and artificially designed *Laubwände* [walls of leaves] and created meticulous diagrams to document and analyse the differences in plants (Fig. 3). Microphones and sound-level meters helped measure how sound waves were filtered by the vegetation. Working in the field, his long-term studies noted seasonal variations and atmospheric conditions, such as wind direction, humidity, air pressure and temperature.

Beck systematised plants according to their 'species-specific level of noise reduction' (Fig. 4). Plants such as *Acer pseudoplantanus* [sycamore]—which could reduce sound by up to twelve decibels—were grouped together with *Tilia platyphyllos* [large-leaved lime] and *Viburnum lantana* [wayfaring tree], as all three species were considered especially suitable for buffering sound in open spaces. Despite their smaller size, evergreens, such as *Rhododendron* 'catawbiense grandiflorum' [rhododendron], were recommendable for public spaces, as they significantly lowered decibel levels in the winter months. To represent the changes in the auditory experience of open spaces, Beck produced photographs with detailed drawings of decibel levels that mapped how different trees reflect sound (Fig. 5).

Beck's choice of scientific nomenclature rather than the vernacular names of plants reflects his botanically informed approach. Beck invented a new system to categorise plants, irrespective of the traditional taxonomic system based on species origin, by ordering species according to their functional capacities to alter acoustic space. His surveys included species that were considered native to the city, as well as non-native and accidentally introduced plants. His recommendations for suitable plants included *Viburnum rhytidophyllum* [leatherleaf viburnum], a bush that was brought to Brandenburg from China in 1907 and used as an ornamental plant. Urban ecologists in Berlin first documented its reappearance in 1985, flourishing in the city's waste spaces.[41] Beck also suggested *Acer negundo* [ash-

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SCHALLPEGELMINDERUNG (ΔL) BEZOGEN AUF DEN DURCHSCHNITTLICHEN LAUBEFFEKT = ΔL_1(BELAUBT) − ΔL_2(UNBELAUBT)

Gruppe	Objekt	GATTUNG/ART	$\Delta L_1 - \Delta L_2$
I	H 14	Salix eleagnos	1.2 – 0.7
	H 12	Lonicera tatarica	2.5 – 2.0
	H 20/3	Cotoneaster multifl.	2.3 – 1.8
	T 38	Sophora japonica	3.8 – 3.1
	T 7/10/12/15	Spiraea vanhouttei	1.8 – 1.0
	H 2/11	Ligustrum vulgare	2.0 – 1.2
	H 18	Caragana arboresc.	2.7 – 1.3
II	T 22	Forsythia intermedia	4.5 – 3.0
	T 30	Betula verrucosa	5.7 – 4.1
	H 4/29	Sorbaria sorbifolia	2.7 – 1.1
	T 36	Cornus alba	5.1 – 3.0
	H 15	Cornus sanguinea	2.2 – 0.1
	T 17	Pterocarya fraxinif.	4.0 – 1.8
	T 19	Sambucus nigra	3.0 – 0.8
	T 6/11/13	Philadelphus pubesc.	4.6 – 2.4
	T 21	Alnus incana	3.2 – 0.6
	H 6/19	Crataegus prunif.	3.7 – 1.1
	T 23	Lonicera maackii	6.3 – 3.5
	H 24	Corylus avellana	4.1 – 1.3
	T 27 H 9/10/3/14/15	Fagus silvatica	5.3 – 2.4
III	T 3/29	Carpinus betulus	5.3 – 1.7
	H 1/5/13/28	Ribes divaricatum	5.4 – 1.8
	T 3	Tilia cordata	6.3 – 2.5
	T 28/26 33/34/35	Syringa vulgaris	5.4 – 1.6
IV	T 8/9	Viburnum lantana	6.1 – 1.4
	H 16	Populus berolinens.	9.5 – 4.1
V	T 24	Tilia platyphyllos	6.9 – (-) 0.2
VI	T 43	Acer pseudoplatanus	10.7 – 2.5

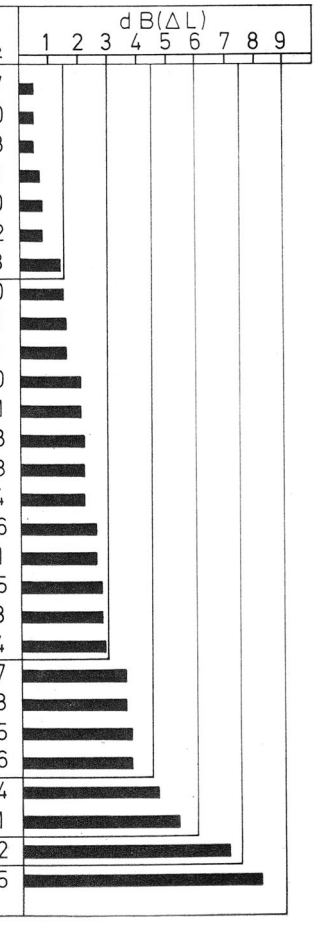

Figure 4. Noise reduction of different plant species in decibel (source: Gerhard Beck, *Pflanzen als Mittel zur Lärmbekämpfung*, 1967, p. 56).

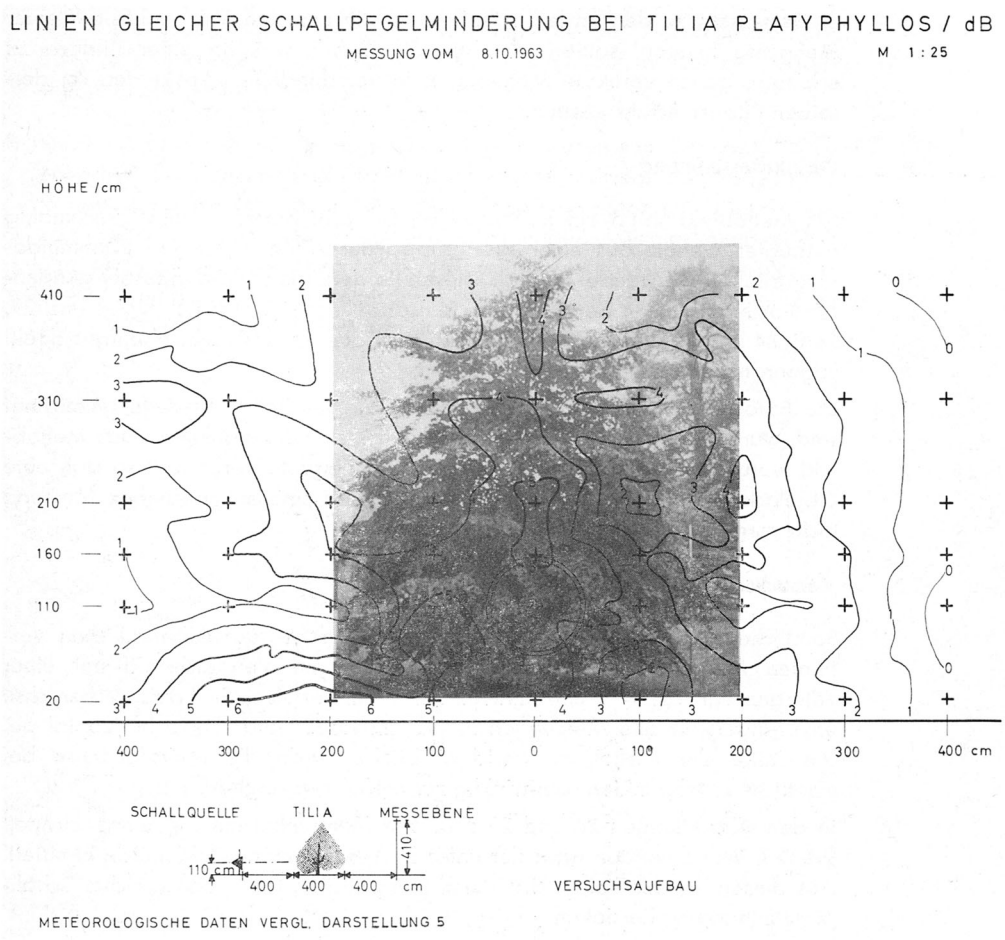

Figure 5. Lines of equal sound-level reduction, *Tilia platyphyllos* (source: Gerhard Beck, *Pflanzen als Mittel zur Lärmbekämpfung*, 1967, p. 84).

leaved maple], now a 'blacklisted' plant considered invasive by ecologists, which was first brought to the city of Leipzig from Canada in 1699 as an ornamental tree, and which became a ubiquitous presence in post-war European cities due to its successful adaptation to rubble spaces.[42] Further recommendations included a range of so-called 'non-native' plants that were considered sonically

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suitable for reducing noise in public spaces. Despite working with scientific nomenclature, Beck did not draw specific links to early insights developed in parallel by botanists, who studied spontaneous nature flourishing in bombed plots and other marginal spaces in the centre of the destroyed city and began to challenge conservative and nativist notions of urban nature.[43]

Beck's classification system was solely centered on the functional aspects of plants in relation to their capacity to rationalise sonic space. His scientific study concluded that any discussion on the use of plants for noise abatement purposes should first consider already existing forms of urban nature before altering the landscape design of any given space.[44] Beck emphasised the need for site-specific research on the acoustic qualities of each open space and questioned the necessity of altering urban nature with costly landscape designs. His results showed that specific plants could reduce noise to up to 10 decibels and significantly decrease loudness. Land use planning could effectively make use of these insights as specific arrangements of plants could allow further urban densification and a more cost-efficient use of land. The selection of specific plants for noise abatement purposes should not only consider their acoustic qualities, but also seasonal changes, especially with non-evergreens, and the maintenance costs of specific landscape designs.

Both—the botanist Rudolf Kühn and the landscape designer Gerhard Beck—emphasised how urban nature can alter the sensory dimensions of space and argued for providing more equal access to greenery and protection from health-threatening acoustic emissions across the island city of West Berlin. They shifted the focus from plants being regarded as merely ornamental or decorative elements of the urban landscape and the pre-occupation with the visual aspects of landscape design to a wider discussion on the embodied, mediated and sensory dimensions of urban nature. While Beck concentrated on how trees and bushes could shield and protect the permeable and thus vulnerable human body from potentially harmful sounds in public spaces, Kühn emphasised the aesthetic qualities of street trees as multi-sensory spaces. Motivated by increasing concerns over the physiological and psychological effects of noise pollution, the work of botanists and landscape designers, such as Beck, can be placed in the context of ongoing discourses on the intersections of urban nature and public health, which can be traced back to the late nineteenth century. Political ideas on the 'right to nature' thus not only encompassed the provision of sunshine, light and air—an ongoing discussion previously centered around the unliveable conditions of Berlin's tenements built during the Wilhelmine era, which continued into the post-war years—but also extended to the 'right to silence' and a yearning for tranquillity in an emerging politics of sound.

Discussion: from wastelands to urban nature parks

Some of Berlin's most recent parks used to be urban wastelands. However, the long-term protection of marginal sites and their transformation into urban parks was a highly contested process. Many sites were lost to recurring phases of urban development.

In the 1960s, West Berlin's urban wastelands emerged as experimental fields for botanists and landscape designers who were interested in the scientific and acoustic dimensions of urban nature. The wider cultural and political significance of marginal spaces was gradually rediscovered a decade later when the island city's *Brachen* were increasingly recognised as a distinctive feature of the urban landscape, having aesthetic and ecological significance. By the mid-1980s, earlier campaigns to protect urban nature were incorporated into a sophisticated alternative plan, *Die Grüne Mitte* [The Green Centre], a large-scale network of green spaces stretching from north to south along the border and across parts of what is now Potsdamer Platz (Fig. 6).[45] The plan integrated *Brachen* as part of public culture by considering their multi-faceted role as spaces of leisure and play, aesthetic experience and scientific inquiry.

The campaign to protect vernacular spaces of urban nature brought together several key actors: Urban ecologists and their scientific insights, a new generation of landscape planners with a 'non-design aesthetics', artists and their cultural valorisation of *terrains vagues*, and activists and citizens, who politically supported and demanded the protection of marginal sites as future public spaces. This progressive plan was developed by landscape planners in West Berlin with the support of the newly formed radical political party *Alternative Liste: Für Demokratie und Umweltschutz* [Alternative List: For Democracy and Environmental Protection], in response to the Senate's ongoing plans to redevelop inner-city areas, including a new road network cutting across a range of marginal sites (Fig. 7).[46] The plan proposed not only the protection of vernacular forms of urban nature, but also the retention of cheap and alternative housing and cultural spaces, and a new transport plan significantly to reduce motorised traffic in favour of the expansion of cycling paths and public transport. The plan was underpinned by ecological surveys provided by Herbert Sukopp and his colleagues, who produced detailed maps of ecological assemblages in forty-five different sites listing over 250 rare or endangered species.

The botanist Ullrich Asmus, for example, published a vegetation survey of the abandoned ruins of former embassies in Tiergarten. His survey documented the presence of a range of endangered species, such as *Dianthus armeria* [Deptford pink]. To Asmus, the significance of marginal spaces exceeded merely ecological concerns. *Brachen* were important for 'enhancing the quality of the urban experience; recreational and leisure use, children to play freely outdoors; as a possibility for urban gardening; environmental protection; creating ecological refugia; the scientific study of urban ecology; bio-indicators for environmental change; education and learning'.[47] He further elaborated on the role of *Brachen* in lowering the 'urban heat island effect' and emissions including urban noise, emphasising their key role in changing the acoustic experience of urban space.[48]

With the fall of the Berlin Wall, this progressive planning proposal for a socially and environmentally just city was eventually abandoned. After reunification, Berlin's urban planning paradigm shifted towards 'closing open wounds' of the formerly divided city and many marginal spaces were lost in

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Figure 6. Ecologically relevant sites: note that these sites, apart from existing parks, are wastelands (map by Jens Kreitmeyer; source: Alternative Liste, Bereich Umwelt- und Naturschutz, ed., Zum Thema: Stadtentwicklung. Die 'Grüne Mitte'. Das Konzept der Alternativen Liste zum Zentralen Bereich [Berlin, Hilberts & Pösger, 1984], map 5).

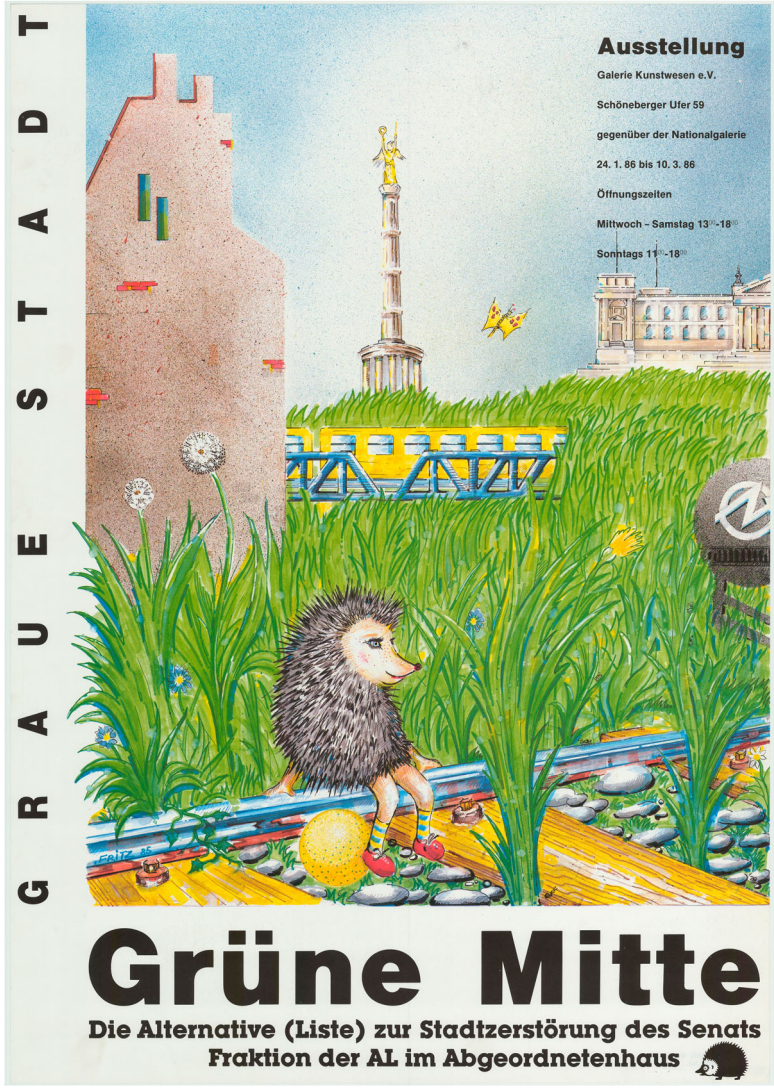

Figure 7. Alternative List poster, *Die Grüne Mitte*, 1984 (source: Landesarchiv).

the context of large-scale urban redevelopment projects, such as Potsdamer Platz and the new government quarter. Landscape planners who had envisioned a green urban centre were now faced with fighting to protect 'every inch of green against Daimler'.[49]

In the early 2000s, a range of former wastelands were turned into public parks. Originally part of *Die Grüne Mitte* planning proposal, these parks can be considered as remnants of this earlier phase of environmental politics that had reached its peak in the mid-1980s. After more than two decades of campaigning, the Südgelände Nature Park finally opened in the year 2000. It was the first of a series of new park designs for abandoned former railway spaces that included existing elements of spontaneous nature.[50] The landscape design for Park am Gleisdreieck, opened in 2011, not only incorporated existing ecological assemblages that had flourished in the railway ruins, such as the *Gleis-Wildnis* [track wilderness] of birch trees, but also identified spontaneous vegetation as part of an open 'laboratory' for visitors to observe.[51] Both sites were protected as so-called 'compensation spaces' for the destruction of existing spaces of nature in more central locations across the city.

These sites formed part of a large-scale abandoned railway network, some sections of which are still intact and actively in use, cutting across or alongside the parks. Spontaneous vegetation and infrastructural elements, whose functions have ceased, are now part of the aesthetic design of the parks. Whilst the ecological and visual aspects of this new 'wasteland aesthetics' in landscape design have been explored, these former railway spaces also have a distinctive acoustic quality.[52] Reflecting on the importance of urban history and human intervention in the Südgelände Nature Park, the sociologist Jens Lachmund asks us to consider the park as an acoustic space (Fig. 8):

> We hear the city and traffic filtering in. If we let this be part of the experience of this park, the experience of nature is not one opposed to the city, but rather a distinctive way of experiencing the city, a lens for seeing the city and nature in a new way … as reflecting our history and conflict.[53]

In a recent publication on its award-winning landscape design, a section of the Park am Gleisdreick, opened in 2011, is described as follows (Fig. 9):

> West Park, 9.30 am: Jarring and rumbling. The U1 passes through a gorge of houses and from Gleisdreieck underground station the warning signal can be heard before the doors of the train close. Gradually, the acoustic warning systems of cranes working on the nearby building sites join in with the rhythm of the metropolis. A cacophony of engine noise from the motorcades on both sides of the Landwehrkanal completes the living soundtrack of Berlin.[54]

The authors further elaborate on the distinctive qualities of the location: 'no other city centre green space manages to give its visitors such a feeling of vastness and tranquillity while at the same time elevating the presence of the metropolis'.[55] The railway sounds audible across this public park are described as distinctive part of 'the living soundtrack of Berlin'. Thus, railway lines not only represent a visual element in the design of the park, but also create an acoustic quality, which forms part of the experi-

Figure 8. Südgelände Nature Park, 2015 (photograph by the Author).

ence of these public spaces and recalls their history as former infrastructural spaces. Rather than attempting to create silent zones, these urban parks have incorporated the presence of human and machine sounds in their landscape design. Yet, with increasing development pressures and construction on the edges of the Park am Gleisdreick, it remains uncertain whether the balance between tranquillity, the rustling of leaves, birdsong, insects, human voices, the rhythmic sounds of passing trains and the ambient city filtering in can be maintained in the future.

In the 1960s, landscape designers in West Berlin used the city's marginal landscapes as field sites for sonic experimentation. Their focus was centred on questions of public health. Revisiting their work has revealed how engagements with the acoustic realm are part of a longer history of urban planning and landscape design in Berlin. Modernist attempts to rationalise urban space were not only concerned with air, light and sun, but also with sound. Whilst the scientific insights of botanists and urban ecologists have made a major contribution to planning policies, to the protection of these sites and to a

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Figure 9. Park am Gleisdreieck, 2016 (photograph by the Author).

new visual aesthetic language in landscape design that has influenced the designs of parks, Beck's experimental study of the acoustic dimensions of urban vegetation was not directly incorporated. However, his field surveys and publications are cited to the present day by urban and landscape planners working on noise abatement.[56] The use of plants for altering the sonic qualities of urban space has remained a marginal field in landscape design, yet Beck's botanically informed approach and his long-term studies in the field have led him to question costly design interventions and therefore remain relevant currently. His work anticipated the idea of non-design that has become more prominent in contemporary landscape design discourses.

The work of landscape designers shows how attempts to address the problem of noise as a negative by-product of modernity did not result in an anti-

urban or anti-technological stance. Their work reflects an ongoing belief in the potential of design innovation to bring about cultural and social change, and to improve the quality of public spaces; an 'acoustic modernism'. As historical precursors to contemporary experiments with soundscapes in environmental design, their work represents an intellectual lineage of the 1960s, which is contemporaneous with but largely disconnected from the work of acoustic ecologists now widely cited. Landscape designers in post-war Berlin were drawing on late nineteenth and early twentieth century ideas of nature as a remedy for the negative effects of modern urban life on the human body.

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All translations from the German are the Author's.

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